

**REMARKS**

Reconsideration and allowance of this application are respectfully requested in view of the amendments and the discussion below.

Applicants gratefully acknowledge the allowance of claims 8, 9, 14 and 18 but respectfully traverse the rejection of claims 1-7, 10-13, 15-17, 19 and 20 based on distinguishing features of independent claims 1, 11 and 12 which features are not available from the references of record.

More particularly claims 1, 3 and 7 have been rejected under 35 U.S.C. 102 as anticipated by the reference to Scheib U.S. Patent No. 4,169,377 while claims 2, 4-6, 11, 12, 16, 17 and 19-20 have been rejected under 35 U.S.C. 103 as unpatentable over Scheib in view of Murata et al. U.S. Patent No. 5,148,708, as indicated at items 11 and 12 of the patent Office Action.

The reference to Scheib is a quantity sensing system for a container which uses a level sensor and a monitor. The sensor is constructed with a pipe having pairs of electrodes exposed to fluid and with these electrodes being connected to resistance bars to be able to produce a signal proportional of the voltage signal across the resistance. The electrodes are labeled as 16 in Figure 3 with each electrode being connected by a conductor 21 to one of two wire resistance elements the resistance elements 20 are electrically insulated from each other.

Applicants invention, as defined by claim 1 concerns a sensor element for measuring the position of liquid level in capillaries which operates in the

environment of pipette dispensers in medical laboratories and in the pharmaceutical industry. Claim 1 embodies the showing of Figure 3 wherein the sensor element includes a substrate 2 which includes a plurality of electrodes 3, as indicated in Figure 1. These electrodes can be contacted individually and are mounted on the substrate. The electrodes includes sensor-active partial electrodes 5 that are network with electrically connection 7. These partial electrodes of 2 respective electrodes are positioned opposite one another, as shown in Figure 2, and are separated by a distance as illustrated by the circle 11 which shows the partial electrode pairs being formed and separated. The electrode pairs are periodically spaced over the length of the sensor element and the electrodes are electrically insulated from each other.

According to the statement of the rejection, the reference to Scheib has a plurality of electrodes 16 adapted to be contacted individually were the electrodes are networked with an electrical connection. Applicants respectfully submit that there is no showing of the “sensor-active partial electrodes that are networked with electrically connections”. Claim 1 recites a plurality of electrodes which comprise sensor active partial electrodes. If an analogy is made between the electrodes 16 and the electrodes of claim 1 then there are no sensor-active partial electrodes networked with the electrically connection as shown in Figure 2 and as claimed in claim 1. It is be noted that according to the rejection the “electrodes are networked with electrically connections” and the “electrodes are electrically insulated from each other”. These two statements are contradictory and the claims specifically

recite that it is the “partial electrodes” which are networked with electrically connection and it is the “electrodes” which are electrically insulated from each other. In other words, an electrode is made up of a series of partial electrodes which are connected together to form the electrode. This “connected together” is the item 7 as discussed above in Figure 2. Therefore it is submitted that claim 1 defines subject matter not available from the reference to Scheib.

With respect to the rejection of claims 2, 4-6, 11-12, 16-17 and 19-20 over the combination of Scheib and Murata et al., Applicants submit that the reference to Murata et al. adds nothing to the reference to Scheib with respect to meeting claim limitations of independent claims 11 and 12.

Claim 11 utilizes the structure of claim 1 to determine which electrode pairs are covered and to compare the resistance values to characteristic minimum and maximum values and to detect the position of the liquid level or of a bubble on a specific electrode pair, when these electrodes are electrically insulated from each other.

The reference to Murata et al. has been cited for disclosing a liquid level sensor using a plurality of electrodes. Applicants submit that the reference to Murata et al. has all of the electrodes of the sensor electrically connected so there is no teaching with respect to combining independent electrode pairs over the length of the liquid sensor even if the references to Murata and Scheib were to be combined.

Additionally, the above discussed features with respect to the partial electrodes being electrically connected and the electrodes being insulated from each other are not shown or disclosed by any of the references of record.

Independent claim 12 similarly defines subject matter of independent claim 1 and further recites step limitations with respect to electrode pairs and obtaining the position of the conductivity boundary for a specific partial electrode pair which again is not available from the references of record or any combination which would be obvious to one of ordinary skill in the art. Claims 2, 4-6, 16-17, 19 and 20 variously depend from independent claims 1, 11 and 12 and are thus are submitted as being allowable.

Claim 4 was rejected under 35 U.S.C 112, first paragraph, as containing subject matter not described in the specification. In response to this rejection Applicants have cancelled claim 4.

Claim 3 was rejected under 35 U.S.C. 112, first paragraph, with respect to the term “or”. In response to this rejection Applicants have amended claim 3 to delete the term “or”.

Claim 17 has been rejected under 35 U.S.C. 112, first paragraph, because lack of support for an alternating current in the range of 100 millivolts.

Applicants respectfully traverse this rejection on the grounds that paragraph [0028] on page 10 indicates “an alternating current ranging up to 100 millivolts”.

Claim 10 has been rejected under 35 U.S.C. 112, second paragraph, as being indefinite with respect to the limitation “bubbles”. In response to this rejection Applicants have amended claim 10 so that it refers to a single bubble. On the other hand, the terminology “at least one” refers not to the bubble but to the fact that either the bubble is filled with gas and/or the length of the bubble is approximately twice the length of electrode pair and/or the same operating liquid is present on both sides of the bubble. This terminology is an accepted manner of claiming the and/or limitation.

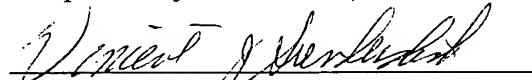
Therefore in view of the changes to the claim structure to obviate the rejections under 35 U.S.C. 112, and in view of the distinguishing features between the claimed invention and the references which features are not shown or disclosed or made obvious by the references or their combination, Applicants respectfully request that this application containing claims 1-20 be allowed and be passed to issue.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #029182.50898US).

November 4, 2003

Respectfully submitted,



Vincent J. Sunderdick

Registration No. 29,004

CROWELL & MORING, LLP  
P.O. Box 14300  
Washington, DC 20044-4300  
Telephone No.: (202) 624-2500  
Facsimile No.: (202) 628-8844

VJS:adb